Practitioner's Docket No. U 013830-8

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: WILLIAM **DAWSON**
Serial No.: 10/046,657 Group No.: 3643
Filed: January 16, 2002 Examiner: --
For: RODENTICIDE AND METHOD OF SCREENING

Assistant Commissioner for Patents
Washington, D.C. 20231

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Attached please find the certified copy of the foreign application from which priority is claimed for this case:

Country: UNITED KINGDOM

Application Number: 0101136.0

Filing Date: January 17, 2001

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I also certify that the attached copy of the request for grant of a Patent (Form 1/77) bears an amendment, effected by this office, following a request by the applicant and agreed to by the Comptroller-General.

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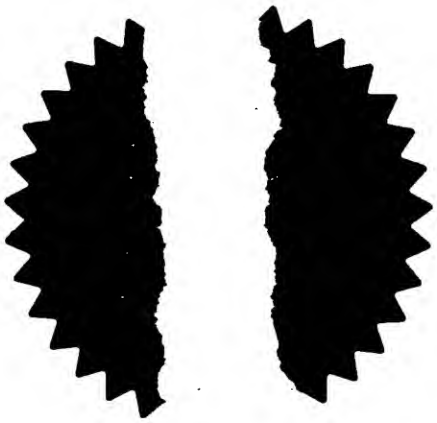

Signed Stephen Hordle

Dated 31 January 2002

GB0101136.0

By virtue of a direction given under Section 30 of the Patents Act 1977, the application is proceeding in the name of

NATROCELL TECHNOLOGIES LTD
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[ADP No. 08200677001]

Patents Form 1/77

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1. Your reference DELMAR 5

2. Patent application number *(The Pat.* 0101136.0 17 JAN 2001

3. Full name, address and postcode of the or each applicant *(Underline all surnames)*

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17JAN01 E598483-1 D10013
P01/7700 0.00-0101136.0

SECTION 30(1977 ACT) APPLICATION FILED 24/07/01

T93737806

Patents ADP number *(if you know it)*

If the applicant is a corporate body, give the country/state of its incorporation

4. Title of the invention Rodenticide and method of screening

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5. Name of your agent *(if you have one)*

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7876648.001

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Rodenticide and method of screening

The present invention relates to rodenticides and to methods of screening for rodenticidal activity.

In our patent GB 2,311,464B a novel class of rodenticides is disclosed, based on cellulosic material derived from (eg the core of the cobs of) certain hybrids of maize, namely the Dekalb DK 446 hybrid and agonists thereof. The cellulosic material constitutes the active rodenticidal material and the disclosed rodenticides are non-toxic to humans, domestic animals and livestock.

The mode of mortality disclosed in that patent involved excretion of fat and adipose tissue but the precise biological action is unclear. It has now been appreciated that the above rodencticides retain water in the gut and that the resulting disruption of water transport through the gut wall in turn interferes with the normal digestion of the rat. Among the various methods of water transport into and out of cells, passage through ion channels is one of the important processes. These channels vary amongst mammals and in it has now been found that cellulosic material is particularly effective at modifiying ion transport in rodents. Consequently the rat is weakened and dies.

In particular it has been unexpectedly found that the thymus is reduced in size in rats who have been fed the above cellulosic rodenticides, indicative of a compromised immune system, and it is envisaged that other water-retentive materials will have a similar effect. It is considered that their water-retentive effect disrpupts ion transport through ion channels in the wall of the gut. In practical terms, it has now been found that such materials reduce the number of immuno-competent cells when ingested by rodents. In particular it is considered that the generation of T-lymphocytes in the thymus of rodents is inhibited by ingestion of water-retentive materials. Any of these effects can be used as a basis for a method of screening candidate rodenticides in accordance with an aspect of the invention.

It is also noted that in rats, digestion of cellulose takes place mainly in the caecum as a result of the action of bacteria in that region of the gut, whereas in humans the caecum is vestigial and has no digestive action on cellulose. It is now considered that water-retentive materials, when ingested by rats, compromise their digestion in the caecum. It is this specific characteristic of rats and other rodents that is now considered to be responsible for the effectiveness of the rodenticides of GB 2,311,464B.

Accordingly, in one aspect the invention provides a rodenticide comprising a water-retentive material as the active ingredient and a rodent attractant.

Preferably the water-retentive material is cellulosic material.

In certain embodiments the water-retentive material comprises alpha-cellulose. In one preferred embodiment the cellulosic material comprises purified cellulose derived from the core of the cob of the DK 446 maize hybrid or from the core of the cob of a hybrid related to the of an agonist of the DK 446 hybrid.

The invention also provides method of making a rodenticide comprising the steps of combining a water-retentive material with a rodent attractant, the water-retentive material being the active ingredient of the rodenticide.

In view of the newly postulated mode of action, the invention is not limited to water-retentive materials derived from corn-cobs.

Accordingly, in another aspect the invention provides a rodenticide comprising cellulosic water-retentive material as the active ingredient and a rodent attractant, the cellulosic water-retentive material being substantially free of corn-cob material.

In this aspect the invention also provides a rodenticide comprising cellulosic water-retentive material as the active ingredient and a rodent attractant, the cellulosic water-retentive material being substantially free of material derived from the core of the cob of the DK 446 maize hybrid or from the core of the cob of an agonist of the DK 446 hybrid.

Also in this aspect the invention provides a method of making a rodenticide, the method comprising the step of combining cellulosic water-retentive material with a rodent attractant, the cellulosic water-retentive material being substantially free of corn-cob material and being the active ingredient of the rodenticide. Preferably the cellulosic water-retentive material is substantially free of material derived from the core of the cob of the DK 446 maize hybrid or from the core of the cob of an agonist of the DK 446 hybrid.

Preferably at least the water-retentive material is dried.

The rodenticides of the present invention are preferably combined with a sweet material such as molasses (which acts as a rodent attractant) and pelletised by the methods disclosed in GB 2,311,464, which is incorporated herein by reference. The pellets are preferably packaged in moisture-proof bags in order to preserve the dry

state (and hence water-absorbing) properties of the rodenticide.

It is envisaged that a wide variety of water-retentive materials may be suitable for use as rodenticides. The most useful materials are expected to be non-toxic (to humans) materials of natural origin such as celluloses whose water-retentive properties arise from their macromolecular structure. Other suitable materials can be found by experiment.

Accordingly, in another aspect the invention provides a method of screening water-retentive materials for rodenticidal activity, wherein a water-retentive material is fed to rodents (preferably laboratory rats) and the rodents are tested to determine whether or to what extent the water-retentive material has disrupted water transport through the wall of the gut.

Preferably the rats are examined post mortem.

Preferably the effect of ingesting the water-retentive material on the size or condition of the thymus gland is tested.

Preferably the water-retentive material is substantially non-toxic to humans.

Other preferred features are defined in the dependent claims.

Claims

1. A rodenticide comprising a water-retentive material as the active ingredient and a rodent attractant.

2. A rodenticide according to claim 1 wherein the water-retentive material is cellulosic material.

3. A rodenticide according to claim 2 wherein the water-retentive material comprises alpha-cellulose.

4. A rodenticide according to claim 2 or claim 3 wherein the cellulosic material comprises purified cellulose derived from the core of the cob of the DK 446 maize hybrid or from the core of the cob of an agonist of the DK 446 hybrid.

5. A rodenticide comprising cellulosic water-retentive material as the active ingredient and a rodent attractant, the cellulosic water-retentive material being substantially free of corn-cob material.

6. A rodenticide comprising cellulosic water-retentive material as the active ingredient and a rodent attractant, the cellulosic water-retentive material being substantially free of material derived from the core of the cob of the DK 446 maize hybrid or from the core of the cob of an agonist of the DK 446 hybrid.

7. A rodenticide according to any preceding claim, further comprising a binder.

8. A rodenticide according to any preceding claim which is in pellet form.

9. A rodenticide according to any preceding claim wherein the bait attractant comprises sweet material.

10. A rodenticide according to claim 9 wherein the bait attractant comprises molasses.

11. A rodenticide according to any preceding claim which in use disrupts ion transport through the wall of the gut of the rodent.

12. A moisture-proof container of rodenticide as claimed in any preceding

claim.

13. A method of making a rodenticide comprising the steps of combining a water-retentive material with a rodent attractant, the water-retentive material being the active ingredient of the rodenticide.

14. A method according to claim 13 wherein the water-retentive material is cellulosic material.

15. A rodenticide according to claim 13 wherein the water-retentive material comprises alpha-cellulose.

16. A method according to claim 14 or claim 15 wherein the cellulosic material comprises purified cellulose derived from the core of the cob of the DK 446 maize hybrid or from the core of the cob of an agonist of the DK 446 hybrid.

17. A method according to any of claims 13 to 16 wherein at least the water-retentive material is dried under conditions of heat and/or pressure.

18. A method of making a rodenticide, the method comprising the step of combining cellulosic water-retentive material with a rodent attractant, the cellulosic water-retentive material being substantially free of corn-cob material and being the active ingredient of the rodenticide.

19. A method as claimed in claim 18, wherein the the cellulosic water-retentive material is substantially free of material derived from the core of the cob of the DK 446 maize hybrid or from the core of the cob of an agonist of the DK 446 hybrid.

20. A method according to any of claims 13 to 19 wherein at least the water-retentive material is dried under conditions of heat and/or pressure.

21. A method according to any of claims 13 to 20 wherein the rodenticide is pelletised.

22. A method of screening water-retentive materials for rodenticidal activity, wherein a water-retentive material is fed to rodents and the rodents are tested to determine whether or to what extent the water-retentive material has disrupted water transport through the wall of the gut.

23. A method according to claim 22 wh rein the rodents are tested to determine whether or to what extent the water-retentive material has disrupted ion transport through the wall of the gut.

24. A method according to claim 22 or claim 23 wherein the water-retentive material is of natural origin.

25. A method according to any of claims 22 to 24 wherein the water-retentive material is cellulosic material.

26. A method according to claim 25 wherein the water-retentive material is derived from corn-cobs.

27. A method according to any of claims 22 to 26 wherein the rodents are examined post mortem.

28. A method according to any of claims 22 to 27 wherein the effect of ingesting the water-retentive material on the size or condition of the thymus gland is tested.

29. A method according to any of claims 22 to 28 wherein the water-retentive material is substantially non-toxic to humans.

Abstract

Rodenticide

A rodenticide which is non-toxic to humans, domestic animals and livestock comprises a water-retentive material as the active ingredient and a rodent attractant. Preferably the water-retentive material is cellulosic material. In certain embodiments the water-retentive material comprises alpha-cellulose. In one preferred embodiment the cellulosic material comprises purified cellulose derived from the core of the cob of the DK 446 maize hybrid or from the core of the cob of an agonist of the DK 446 hybrid. It is considered that the unique selective toxicity of such rodenticides arises from the interference with water transport through the gut wall, particularly in the caecum (where cellulose is digested in rats). The caecum is vestigial in humans, who are not therefore affected by such materials.